Proposed Field of Study Curricula for Engineering Technology

Tracks leading to the Bachelor of Science degree with a major in:

Civil Engineering Technology
Computer Engineering Technology
Construction Engineering Technology
Electrical/Electronic Engineering Technology
Manufacturing Engineering Technology
Mechanical Engineering Technology

Civil Engineering Technology Track

There are three universities in Texas that offer Civil Engineering Technology degrees. All institutions have the same Math requirements, but Physics requirements vary across these three institutions. Review of the Physics requirements in these programs suggest two sub-tracks: (1) Calculus and Algebra-based Physics and (2) Calculus and Calculus-based Physics. Therefore, this field of study will offer two sub-tracks to accommodate all institutional requirements.

Computer Engineering Technology Track

There are three universities in Texas that offer Computer Engineering Technology degrees; Math and Physics requirements are the same across these three institutions. Reviews of the Math and Physics requirements in these programs suggest one track: (1) Calculus and Algebra-based Physics. Therefore, this field of study offers one track to accommodate all institutional requirements.

Construction Engineering Technology Track

There are seven universities in Texas that offer Construction Engineering Technology degrees; Math and Physics requirements vary across these seven institutions. Review of the Math and Physics requirements in these programs suggest three sub-tracks: (1) Algebra and Algebra-based Physics, (2) Calculus and Algebra-based Physics, and (3) Calculus and Calculus-based Physics. Therefore, this field of study offers three sub-tracks to accommodate all institutional requirements.

Electrical/Electronic Engineering Technology Track

There are nine universities in Texas that offer Electrical/Electronic Engineering Technology degrees; Math and Physics requirements vary across these nine institutions. Review of the Math and Physics requirements in these programs suggest three sub-tracks: (1) Algebra and Algebra-based Physics, (2) Calculus and Algebra-based Physics, and (3) Calculus and Calculus-based Physics. Therefore, this field of study offers three sub-tracks to accommodate all institutional requirements.

Manufacturing Engineering Technology Track

There are fourteen universities in the state of Texas that offer Manufacturing Engineering Technology degrees. The Math and Physics requirements vary across these fourteen institutions. A review of the Math and Physics requirements in these programs suggest three sub-tracks: (1) Algebra and Algebra-based Physics, (2) Calculus and Algebra-based Physics, and (3) Calculus and Calculus-based Physics. Therefore, this field of study offers three sub-tracks to accommodate all institutional requirements.

Mechanical Engineering Technology Track

There are eight universities in Texas that offer Mechanical Engineering Technology degrees; Math and Physics requirements vary across these institutions. Review of the Math and Physics requirements in these programs suggest three sub-tracks: (1) Algebra and Algebra-based Physics, (2) Calculus and Algebra-based Physics, and (3) Calculus and Calculus-based Physics. Therefore, this field of study offers three sub-tracks to accommodate all institutional requirements.

Notes:

1) The following abbreviations were used for Texas public four-year universities:

LAMAR	Lamar University
MSU	Midwestern State University
PVAMU	Prairie View A&M University
SHSU	Sam Houston State University
SRSU	Sul Ross State University
SWTSU	Southwest Texas State University
TAMU	Texas A&M University
TAMUC	Texas A&M University-Commerce
TAMU-CC	Texas A&M University-Corpus Christi
TAMU-K	Texas A&M University-Kingsville
TASU	Tarleton State University
TSU	Texas Southern University
TTU	Texas Tech University
UH	University of Houston
UH-CL	University of Houston-Clear Lake
UH-D	University of Houston-Downtown
UNT	University of North Texas
UT-B	The University of Texas at Brownsville
UT-T	The University of Texas at Tyler
WTAMU	West Texas A&M University

2) The tracks for Electrical/Electronic Engineering Technology and Computer Engineering Technology are the same.

3) The tracks for Manufacturing Engineering Technology and Mechanical Engineering Technology are the same.

4) The tracks for Civil Engineering Technology and Construction Engineering Technology are different from all the others.

Civil Engineering Technology

Content Area	*Sub-Track 1	**Sub-Track 2	Semester Credit Hours (SCH)
Mathematics	Calculus I (MATH 2413)	Calculus I (MATH 2413)	4
	Calculus II (MATH 2414)	Calculus II (MATH 2414)	4
Physical Sciences	Physics I (Algebra-based) (PHYS 1401)	Physics I (Calculus-based) (PHYS 2425)	4
	Physics II (Algebra-based) (PHYS 1402)	Physics II (Calculus-based) (PHYS 2426)	4
Physical Sciences	Chemistry I (CHEM 1411)		4
Engineering	Engineering Design Graphics (ENGR 1304)		3
Engineering	Surveying (ENGR 1407)		4
Technology	[1]AC/DC Circuits (CETT 1409)		4
Technology	[2]Materials and Methods (CNBT 2304)		3
English	[3]Technical and Business Writing (ENGL 2311 or ETWR 2301)		3
			37 Total SCH

*Sub-Track 1 allows transfer to the following institutions: UH-D and TSU.
**Sub-Track 2 allows transfer to UNT and all of the institutions listed in sub-track 1.

[1]Recommend that universities accept CETT 1409 from the Workforce Education Course Manual (WECM) and give credit for the equivalent institutional requirement.

[2]Recommend that universities accept CNBT 2304 from the Workforce Education Course Manual (WECM) and give credit for the equivalent institutional requirement.

[3]Recommend that universities accept ETWR 2301 from the Workforce Education Course Manual (WECM) as a substitute for ENGL 2311 [found in the Academic Course Guide Manual (ACGM)].

Computer Engineering Technology

Content Area	*Sub-Track 1	Semester Credit Hours (SCH)
Mathematics	Calculus I (MATH 2413)	4
	Calculus II (MATH 2414)	4
Physical Sciences	Physics I (Algebra-based) (PHYS 1401)	4
	Physics II (Algebra-based) (PHYS 1402)	4
Physical Sciences	Chemistry I (CHEM 1411)	4
Technology	[1]Circuits I	4
Technology	[1]Circuits II	4
Technology	[1]Digital Fundamentals	4
English	[2]Technical and Business Writing (ENGL 2311 or ETWR 2301)	3
		35 Total SCH

*Sub-Track 1 allows transfer to all institutions offering a degree in this area including: UH, PVAMU, and UH-D.

[1]This is a new course; the actual course title and course number will be determined by the Lower-Division Academic Course Guide Manual (ACGM) Advisory Committee.

[2]Recommend that universities accept ETWR 2301 from the Workforce Education Course Manual (WECM) as a substitute for ENGL 2311 (found in the ACGM).

Construction Engineering Technology

Content Area	*Sub-Track 1	**Sub-Track 2	***Sub-Track 3	Semester Credit Hours (SCH)
Mathematics	College Algebra (MATH 1314) Plane Trigonometry (MATH 1316) OR PreCalculus) (MATH 2412)	Calculus I (MATH 2413) Calculus II (MATH 2414)	Calculus I (MATH 2413) Calculus II (MATH 2414)	3-4 3-4
Physical Sciences	Physics I (Algebra-based) (PHYS 1401) Physics II (Algebra-based) (PHYS 1402)	Physics I (Algebra-based) (PHYS 1401) Physics II (Algebra-based) (PHYS 1402)	Physics I (Calculus-based) (PHYS 2425) Physics II (Calculus-based) (PHYS 2426)	4 4
Physical Sciences	Chemistry I (CHEM 1411)			4
Engineering	Engineering Design Graphics (ENGR 1304)			3
Engineering	Surveying (ENGR 1407)			4
Technology	[1]AC/DC Circuits (CETT 1409)			4
Technology	[2]Materials and Methods (CNBT 2304)			3
English	[3]Technical and Business Writing (ENGL 2311 or ETWR 2301)			3
				35-37 Total SCH

*Sub-Track 1 allows transfer to the following institutions SHSU, SWTSU, and TAMUC.
**Sub-Track 2 allows transfers to TAMU, TTU, UH and all of the institutions listed in sub-track 1.
***Sub-Track 3 allows transfer to UNT and all of the institutions listed in sub-track 1 and 2.

[1]Recommend that universities accept CETT 1409 from the Workforce Education Course Manual (WECM) and give credit for the equivalent institutional requirement.
[2]Recommend that universities accept CNBT 2304 from the Workforce Education Course Manual (WECM) and give credit for the equivalent institutional requirement.
[3]Recommend that universities accept ETWR 2301 from the Workforce Education Course Manual (WECM) as a substitute for ENGL 2311 (found in the ACGM).

Electrical/Electronic Engineering Technology

Content Area	*Sub-Track 1	**Sub-Track 2	***Sub-Track 3	Semester Credit Hours (SCH)
Mathematics	College Algebra (MATH 1314) Plane Trigonometry (MATH 1316) OR PreCalculus) (MATH 2412)	Calculus I (MATH 2413) Calculus II (MATH 2414)	Calculus I (MATH 2413) Calculus II (MATH 2414)	3-4 3 -4
Physical Sciences	Physics I (Algebra-based) (PHYS 1401) Physics II (Algebra-based) (PHYS 1402)	Physics I (Algebra-based) (PHYS 1401) Physics II (Algebra-based) (PHYS 1402)	Physics I (Calculus-based) (PHYS 2425) Physics II (Calculus-based) (PHYS 2426)	4 4
Physical Sciences	Chemistry I (CHEM 1411)			4
Technology	[1]Circuits I			4
Technology	[1]Circuits II			4
Technology	[1]Digital Fundamentals			4
English	[2]Technical and Business Writing (ENGL 2311 or ETWR 2301)			3
				33-35 Total SCH

*Sub-Track 1 allows transfer to the following institutions: SHSU and UT-B.
**Sub-Track 2 allows transfer to the following institutions: UH, TTU, PVAMU, TSU and all institutions listed in sub-track 1.
***Sub-Track 3 allows transfer to all institutions in sub-track 1 and 2 and also to TAMU, UNT, and TAMU-CC.

[1]This is a new course; the actual course title and course number will be determined by the Lower-Division Academic Course Guide Manual (ACGM) Advisory Committee.
[2]Recommend that universities accept ETWR 2301 from the Workforce Education Course Manual (WECM) as a substitute for ENGL 2311 (found in the ACGM).

Manufacturing Engineering Technology

Content Area	*Sub-Track 1	**Sub-Track 2	***Sub-Track 3	Semester Credit Hours (SCH)
Mathematics	College Algebra (MATH 1314) Plane Trigonometry (MATH 1316) OR PreCalculus) (MATH 2412)	Calculus I (MATH 2413) Calculus II (MATH 2414)	Calculus I (MATH 2413) Calculus II (MATH 2414)	3-4 3 -4
Physical Sciences	Physics I (Algebra-based) (PHYS 1401) Physics II (Algebra-based) (PHYS 1402)	Physics I (Algebra-based) (PHYS 1401) Physics II (Algebra-based) (PHYS 1402)	Physics I (Calculus-based) (PHYS 2425) Physics II (Calculus-based) (PHYS 2426)	4 4
Physical Sciences	Chemistry I (CHEM 1411)			4
Engineering	Engineering Design Graphics (ENGR 1304)			3
Technology	[1]Engineering Materials			3
Technology	[1]Introduction to Manufacturing Processes			3
English	[2]Technical and Business Writing (ENGL 2311 or ETWR 2301)			3
				Total 30-32 SCH

*Sub-Track 1 allows transfer to the following institutions: UT-T, LAMAR, WTAMU, SRSU, TSU, and SHSU.
**Sub-Track 2 allows transfer to the following institutions: UH, TASU, MSU, SWTSU, and PVAMU and all institutions listed in sub-track 1.
***Sub-Track 3 allows transfer to all of the programs in the state including those in sub-track 1 and 2 and also to TAMU, TAMUC, and UNT.

[1]This is a new course; the actual course title and course number will be determined by the Lower-Division Academic Course Guide Manual (ACGM) Advisory Committee.

[2]Recommend that universities accept ETWR 2301 from the Workforce Education Course Manual (WECM) as a substitute for ENGL 2311 (found in the ACGM).

Mechanical Engineering Technology

Content Area	*Sub-Track 1	**Sub-Track 2	***Sub-Track 3	Semester Credit Hours (SCH)
Mathematics	College Algebra (MATH 1314) Plane Trigonometry (MATH 1316) OR PreCalculus) (MATH 2412)	Calculus I (MATH 2413) Calculus II (MATH 2414)	Calculus I (MATH 2413) Calculus II (MATH 2414)	3-4 3 -4
Physical Sciences	Physics I (Algebra-based) (PHYS 1401) Physics II (Algebra-based) (PHYS 1402)	Physics I (Algebra-based) (PHYS 1401) Physics II (Algebra-based) (PHYS 1402)	Physics I (Calculus-based) (PHYS 2425) Physics II (Calculus-based) (PHYS 2426)	4 4
Physical Sciences	Chemistry I (CHEM 1411)			4
Engineering	Engineering Design Graphics (ENGR 1304)			3
Technology	[1]Engineering Materials			3
Technology	[1]Introduction to Manufacturing Processes			3
English	[2]Technical and Business Writing (ENGL 2311 or ETWR 2301)			3
				Total 30-32 SCH

*Sub-Track 1 allows transfer to the following institution: UTB.
**Sub-Track 2 allows transfer to the following 5 institutions: UH, UH-D, TTU, PVAMU and all institutions listed in sub-track 1.
***Sub-Track 3 allows transfer to all of the programs in the state including those in sub-track 1 and 2 and also to TAMU, TAMU-CC, and UNT.

[1]This is a new course; the actual course title and course number will be determined by the Lower-Division Academic Course Guide Manual (ACGM) Advisory Committee.

[2]Recommend that universities accept ETWR 2301 from the Workforce Education Course Manual (WECM) as a substitute for ENGL 2311 (found in the ACGM).

New Courses and Course Descriptions

COMPUTER ENGINEERING TECHNOLOGY

Circuits I (4 SCH)
Fundamental concepts of electrical science including potential, current and power in DC circuits. Fundamental laws and relationships applied to the analysis of circuits and networks: capacitance, inductance and magnetism; and single-frequency concepts; use of calculators and computer software in design and analysis of circuits. Standard instrumentation used in test and measurement of DC circuits and systems will be introduced. (Prerequisite: College Algebra)

Circuits II (4 SCH)
Complex AC circuit including transient analysis. Network theorems are applied to the solution of AC circuits. Resonance, filters, AC power and three-phase circuits are covered in detail. Continued application of calculators and computer design and analysis of circuits. Standard instrumentation used in testing AC circuits and systems and measurement of AC circuits and systems will be introduced. (Prerequisites: Circuits I and [Pre-Calculus or Trigonometry])

Digital Fundamentals (4 SCH)
Analysis, design and simulation of combinational and sequential systems using: classical Boolean algebra techniques, laboratory hardware experiments and computer simulation. Introduction to programmable logic devices (PLDs) and application-specific integrated circuits using software tools to the design and analysis of digital logic circuits and systems. Standard instrumentation used in testing digital circuits and systems will be introduced. (Prerequisite: College Algebra)

ELECTRICAL/ELECTRONIC ENGINEERING TECHNOLOGY

Circuits I (4 SCH)
Fundamental concepts of electrical science including potential, current and power in DC circuits. Fundamental laws and relationships applied to the analysis of circuits and networks: capacitance, inductance and magnetism; and single-frequency concepts; use of calculators and computer software in design and analysis of circuits. Standard instrumentation used in test and measurement of DC circuits and systems will be introduced. (Prerequisite: College Algebra)

Circuits II (4 SCH)
Complex AC circuit including transient analysis. Network theorems are applied to the solution of AC circuits. Resonance, filters, AC power and three-phase circuits are covered in detail. Continued application of calculators and computer design and analysis of circuits. Standard instrumentation used in testing AC circuits and systems and measurement of AC circuits and systems will be introduced. (Prerequisites: Circuits I and [Pre-Calculus or Trigonometry])

Digital Fundamentals (4 SCH)
Analysis, design and simulation of combinational and sequential systems using: classical Boolean algebra techniques, laboratory hardware experiments and computer simulation. Introduction to programmable logic devices (PLDs) and application-specific integrated circuits using software tools to the design and analysis of digital logic circuits

and systems. Standard instrumentation used in testing digital circuits and systems will be introduced. (Prerequisite: College Algebra)

MANUFACTURING ENGINEERING TECHNOLOGY

Engineering Materials I (3 SCH)
Instruction in the making and forming of steel and the classification of steel, cast iron, and aluminum. Topics include mechanical and physical properties, non-destructive testing principles of alloying, selection of metals, iron carbon diagrams, principles of hardening and tempering steel, and the metallurgical aspects of machining. Topics will also include an overview of properties and uses of polymers and ceramics. {Lab Required.}

Introduction to Manufacturing Processes (3 SCH)
Exploration of a variety of methods used in manufacturing. Theory and application of processes including but not limited to metal forming, welding, machining, heat treating, plating, assembly procedures, process controls considerations, casting and injection molding. {Lab Required.}

MECHANICAL ENGINEERING TECHNOLOGY

Engineering Materials I (3 SCH)
Instruction in the making and forming of steel and the classification of steel, cast iron, and aluminum. Topics include mechanical and physical properties, non-destructive testing principles of alloying, selection of metals, iron carbon diagrams, principles of hardening and tempering steel, and the metallurgical aspects of machining. Topics will also include an overview of properties and uses of polymers and ceramics. {Lab Required.}

Introduction to Manufacturing Processes (3 SCH)
Exploration of a variety of methods used in manufacturing. Theory and application of processes including but not limited to metal forming, welding, machining, heat treating, plating, assembly procedures, process controls considerations, casting and injection molding. {Lab Required.}

Course Descriptions

[1]CETT 1409
AC/DC Circuits (4 SCH)
Fundamentals of DC circuits and AC circuits operation including Ohm's law, Kirchoff's law, networks, transformers, resonance, phasors, capacitive and inductive and circuit analysis techniques.

CHEM 1411
General Chemistry I (4 SCH)
General principles, problems, fundamental laws, and theories. Course content provides a foundation for work in advanced chemistry and related sciences. {Lecture + Lab}

[1]CNBT 2304
Materials and Methods (4 SCH)
A continuation of the study of the nature, origin and properties of building materials, methods and equipment for their integrated use in completing construction projects. A study of selecting and specifying materials with consideration for economy, quality and performance in the construction of modern buildings.

ENGR 1304
Engineering Graphics (3 SCH)
Introduction to spatial relationships, multiview projection and sectioning, dimensioning, graphical presentation of data, and fundamentals of computer graphics.

ENGL 2311
Technical & Business Writing I (3 SCH)
Principles, techniques, and skills needed for college level scientific, technical, or business writing.

[1]ETWR 2301
Technical Writing (3 SCH)
Study of the principles, techniques, and skills needed for college level scientific, technical, and business writing.

MATH 1316
Plane Trigonometry (3 SCH)
Trigonometric functions, identities, equations, and applications.

MATH 1314
College Algebra (3 SCH)
Study of quadratics; polynomial, rational, logarithmic, and exponential function; systems of equations; progressions; sequences and series; and matrices and determinants.

MATH 2413
Calculus I (4 SCH)
Functions, limits, continuity, differentiation, integration, applications, sequences and series, vector analysis, partial differentiation, and multiple integration. This course may include topics in analytic geometry.

PHYS1401
College Physics I (4 SCH)
Algebra-level physics sequence, with laboratories, that include study of mechanics, heat, waves, electricity and magnetism, and modern physics. {Lecture + Lab}

PHYS 1402
College Physics II (4 SCH)
Algebra-level physics sequence, with laboratories, that include study of mechanics, heat, waves, electricity and magnetism, and modern physics. {Lecture + Lab}

Note:
[1]Existing Workforce Education Course Manual (WECM) Course.